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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,188	11/26/2001	Nasreen Gazala Chopra	10010188-1	8737

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EXAMINER	
KIKNADZE, IRAKLI	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/994,188	CHOPRA ET AL.	
	Examiner	Art Unit	
	Irakli Kiknadze	2882	MW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-31 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-31 is/are rejected.

7)☒ Claim(s) 3 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 3 is objected to because of the following informalities: Claim 3 recites the limitation " said substrate " in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 21 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claimed subject matter is much broader (e.g. MRI, ultrasound imaging) then only an X-ray imaging system and method disclosed in the specification.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1- 4, 9, 12, 15, 16, 27, 28 - 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Francke (US Patent 6,476,397 B1).

With respect to claim 1, Francke teaches (Fig. 1) an X-ray imaging system comprising: a gas detector (9) configured to retain a volume of gas. The gas detector (9) has a first detection circuit (d1; U1; 35; 17; 25) corresponding to a first region of the gas and a second detection circuit (d2; U2; 21; 19) corresponding to a second region of the gas, the first detection circuit being adapted to provide a first signal indicative of X-rays

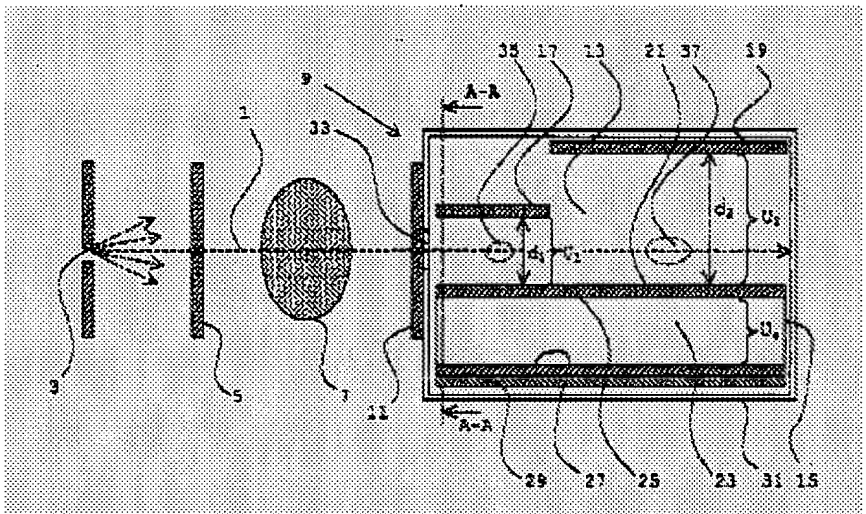

Fig. 1

radiating into the first region of the gas, the second detection circuit being adapted to provide a second signal indicative of an intensity of X-rays radiating into the second region of the gas, the first region of the gas being different than the second region of the gas (column 4; lines 4 - 47).

With respect to claim 2, Francke shows the gas detector (9) including a chamber (13) and the volume of gas is retained within the chamber.

With respect to claim 3, Francke shows the chamber (13) engaging a substrate (15) and the first detection circuit and the second detection circuit are arranged between chamber and the substrate (15) (fig.1).

With respect to claim 4, Francke shows an electrode (19), the chamber (13) is arranged between the electrode (19) and (15) substrate, and the electrode is adapted to apply a potential difference across the gas arranged in the chamber.

With respect to claim 9, Francke teaches first signal corresponding to at least a first pixel and the second signal, corresponds to at least a second pixel (column 12; line 21-29).

With respect to claim 12, Francke shows means for applying a potential difference across the volume of gas (see abstract).

With respect to claims 15 and 16, Francke shows an X-ray imaging method comprising: providing a volume of gas; defining a first region of the gas and a second region of the gas, the first region of the gas being different than the second region of the gas; generating a first signal indicative of an intensity of X-rays radiating into the first region of the gas, the first signal corresponding to at least a first pixel; and generating a second signal indicative of an intensity of x-rays radiating into the second region of the gas, the second signal corresponding to at least a second pixel (column 4; lines 4-47 and column 12; lines 22-29).

With respect to claim 27, Francke shows (Figs. 1 and 7) an imaging method comprising: detecting ionization at respective gas volumes in an array of gas volumes; and converting the ionization detected into an image.

With respect to claim 28, Francke shows: irradiating an object (7) with X-rays (3) so as to ionize at least some of the gas (column 4; lines 5-47 and column 2; lines 32-36).

With respect to claim 31, Francke teaches providing a first pixel; providing a second pixel; rendering the first pixel based on the first signals; and rendering the second pixel based on the second signals (column 12; lines 22-29).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 5, 10, 11,13, 14, 18, 19, 29 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Francke (US Patent 6,476,397 B1) in view of McDaniel et al. (US Patent 4,780,897).

With respect to claim 5, 13, 14 and 18, Francke shows all that is claimed except for a first and second gas reservoirs communicating with the chamber. McDaniel teaches an X-ray detector using two different gases (ion sources) at different pressures. Gasses (e.g. Krypton and Xenon) and pressures could optimally be selected to pass higher energy X-rays an/or to allow interact with lower energy X-rays for producing desirable X-ray image (column 12; lines 15-25). It would have been obvious to one ordinary skill in art at the time invention was made to provide the X-ray imaging system

of Francke with teachings of McDaniel, in order to potentially change operating characteristics of the gas detector so that improved signal corresponding to the detected X-rays can be produced.

With respect to claims 10, 11, 19 and 29 Francke silent about an image processing system with display means. McDaniel teaches the imaging system (32) including a data acquisition system, a computer, processing electronics, electronic data storage and image presentation equipment for reproducing images from digital data. It would have been obvious to one ordinary skill in art at the time invention was made to provide the detector of Francke with the image processing system of McDaniel, in order to reproduce the desirable images from digital data.

With respect to claims 21- 23, Francke shows (Figs. 1 and 7) an imaging system comprising: a gas distributed to define plural imaging volumes arranged in an array, the gas being susceptible to ionization; an ionization detector (9) for providing indications of ionization of the gas for at least some of the imaging volumes. (column 4; lines 6-47 and column 12; lines 35-65). Francke is silent about an image processing system. McDaniel teaches the imaging system (32) including a data acquisition system, a computer, processing electronics, electronic data storage and image presentation equipment for reproducing images from digital data. It would have been obvious to one ordinary skill in art at the time invention was made to provide the detector of Francke with the image processing system of McDaniel, in order to reproduce the desirable images from digital data.

7. Claims 6-8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Francke (US Patent 6,476,397 B1) as applied to claims 1 and 15 above, and further in view of Feige et al. (US Patent 6,204,507 B1).

With respect to claims 6 and 17, Francke shows all that is claimed except for the gas detector comprising the first region of gas defined by a first chamber and the second region of gas defined by a second chamber. Feige teaches a gas-filled ionization detector (Fig.1) comprising a plurality of interconnected measurment chambers (3). For illustration, the volume of gas is retained within a first chamber (3) and the second chamber (3), the first region of the gas is defined by the first chamber, and the second region of gas is defined by the second chamber (column 3; line 42 – column 4; line 4). In this configuration, each of the chambers can correspond to one or more elements of an image processing system in order to achieve a good resolution. It would have been obvious to one ordinary skill in art at the time invention was made to employ the detector arrangement teachings of Feige in order to provide the X-ray detector of Francke with improved resolution.

With respect to claim 7, Feige shows (Fig.1) that first chamber and second chamber pneumatically connected with each other through a free space (14). The common gas filling would allow preventing sensitivity changes caused by the filling gas.

With respect to claim 8, (Fig.1) Including an X-ray stopping/absorbing components arranged between the first chamber and second chamber would allow to absorb off-axis photons, thereby increase resolution of the detector.

8. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Francke (US Patent 6,476,397 B1) in view of McDaniel et al. (US Patent 4,780,897) as applied to claim 21 above, and further in view of Feige et al. (US Patent 6,204,507 B1).

With respect to claims 24-26, Francke combined with the imaging system of McDaniel teaches all that is claimed except for the gas detector comprising the first region of gas defined by a first chamber and the second region of gas defined by a second chamber. Feige teaches a gas-filled ionization detector (Fig.1) comprising a plurality of interconnected measurment chambers (3). For illustration, the volume of gas is retained within a first chamber (3) and the second chamber (3), the first region of the gas is defined by the first chamber, and the second region of gas is defined by the second chamber (column 3; line 42 – column 4; line 4). In this configuration, each of the chambers can correspond to one or more elements of an image processing system in order to achieve a good resolution. It would have been obvious to one ordinary skill in art at the time invention was made to employ the detector arrangement teachings of Feige in order to provide improved resolution for the X-ray detector of Francke combined with the imaging system of McDaniel.

9. Claims 20 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Francke (US Patent 6,476,397 B1) in view of McDaniel et al. (US Patent 4,780,897) as applied to claim 21 above, and further in view of Little et al. (US Patent 5,119,408).

With respect to claims 20 and 30, Francke combined with the imaging system of McDaniel teaches all that is claimed except for moving the object relative to the volume of the gas while the object is being radiated. Little teaches a method (Figs. 3A-3B) for inspecting an object (80) moving relative to a Xenon gas detector (column 4; line79 – column 5; line 16) to obtain dynamic X-ray images corresponding to the object. It would have been obvious to one ordinary skill in art at the time invention was made to employ the teachings of Little in order to provide dynamic X-ray images corresponding to the object with the X-ray detector of Francke combined with the imaging system of McDaniel.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is (703) 305-6464. The examiner can normally be reached on M-F(8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Craig E Church

Irakil Kiknadze
January 7, 2004
IK

Craig E. Church
Primary Examiner